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14. A host cell transformed or transfected with the expression vector of claim 11.

- 15. A host cell transformed or transfected with the expression vector of claim 12.
- 16. A host cell transformed or transfected with the expression vector of claim 13.

Remarks

Claim 7 has been cancelled. Claims 1-6 and 8-16 are currently pending. Claims 1, 6 and 8-10 have been amended herewith.

Claim 1 has been amended to recite a RIP activity selected from the group consisting of DNA binding, protein multimerization, and nucleic acid looping. Support for this amendment can be found throughout the specification and particularly at page 21, lines 24-27.

Claim 1 is further amended to recite stringent conditions as described in the specification. Support for this amendment can be found on page 22, lines 18-24.

Claims 6 and 9-10 has been amended to remove the term "unique."

Claim 6 has been further amended to remove the negative provision objected to by the Examiner.

Claims 8 and 9 have been amended to correct claim dependency.

The specification has been amended to recite "0.015M" rather than "0.15M" sodium citrate in the composition of hybridization buffer component SSC. This was an inadvertent typographical error. Support for this amendment can be found in any standard molecular biology textbook such as <u>Current Protocols in Human Genetics</u> (Appendix A.2D.8) which teaches the composition of 20x SSC to be 3 M NaCl and 0.3M sodium citrate. The recitation of stringent conditions in claim 1, as now amended, includes this amendment.

No new matter has been added.

Rejection under 35 U.S.C. §112, first paragraph

The Examiner has maintained his rejection of claims 1-16 under 35 U.S.C. §112, first paragraph as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s) at the time the application was filed had possession of the claimed invention.

According to the Examiner, the specification does not adequately describe what the terms "RIP activity" or "stringent conditions" encompass.

Applicants have amended claim 1 to further define the terms "RIP activity" and "stringent conditions" as provided by the specification. (See page 21, lines 24-27, and page 22, lines 18-24.)

In view of these amendments, Applicants respectfully request that the Examiner reconsider and withdraw his rejection of now pending claims 1-6 and 8-16 under 35 U.S.C. §112, first paragraph.

Rejection under 35 U.S.C. §112, second paragraph

The Examiner has rejected claims 1, 6 and 9-10 under 35 U.S.C. §112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The Examiner has maintained his rejection of claim 1 in view of the recitation of the term "RIP60 activity" because, as stated previously, "it is unclear which RIP60 activity Applicant is referring to." Applicants have amended claim 1 to further define RIP60 activity. (See page 21, lines 24-27.)

The Examiner has also maintained his rejection of claim 1 in view of the recitation of the term "under stringent conditions" because, as stated previously, the term is ambiguous.

Applicants have further amended claim 1 to include the stringent conditions recited in the specification. (See page 22, lines 9-18.)

Accordingly, in view of these amendments, claim 1 is considered definite.

The Examiner has maintained his rejection of claim 6 in view of the recitation of the term "sequences having the database accession numbers of Table 1." Claim 6 is further rejected because the limitation "other than the exact sequence" is a negative limitation. Applicants have amended the claim to remove the provision of the negative limitation in its entirety. This amendment does not narrow the scope of the claim.

The Examiner has maintained his rejection of claims 6 and 9-10 because of the recitation of the term "unique fragment." Applicants have amended claims 6 and 9-10 to remove the term "unique." This amendment does not narrow the scope of the claim.

Accordingly, in view of these amendments, claims 6 and 9-10 are considered definite.

In view of the foregoing, Applicants respectfully request that the Examiner reconsider

Rejection under 35 U.S.C. §102(a)

and withdraw the rejection of claims 1, 6, and 9-10 under 35 U.S.C. §112, second paragraph.

- 6 -

The Examiner has maintained his rejection of claims 1-3 and 6-9 under 35 U.S.C. §102(a) in view of Sulston et al. (Genome Research, 8(11):1097-1108, 1998). Previously, the Examiner stated that the Sulston et al. reference discloses the polynucleotide sequences reciting SEQ ID NO:1, SEQ ID NO:3, SEQ ID NO:5 and SEQ ID NO:50. The Examiner now states that "the date of publication disclosed in the Genbank listing is prior to Applicant's priority date (1998)" but that the dates upon which the sequences disclosed in the GenBank listing (Accession Number AC005586, in its present form, as relied on by the Examiner) "were publicly available ... are currently being determined."

Applicants respectfully traverse the rejection for the reasons stated below.

The Sulston et al. reference was published in November 1998. It provides no explicit sequence information. It does, however, refer to sequence data posted at the Sanger website. The Examiner has not provided the sequence that was made available by Sulston et al. as of November 1998 on the Sanger website. The Examiner has provided a GenBank listing for the sequence having Accession Number AC005586 submitted by Sulston et al. which is reported to be the complete sequence of the Homo Sapiens PAC clone RP4-584D14 from chromosome region 7q31-q35, having a length of 132150 nucleotides. The GenBank listing (the front page of which is attached hereto as Appendix B) indicates that the sequence, in the form presented and relied upon by the Examiner, was made publicly available by GenBank on September 30, 2000 (see A). Accordingly, the nucleotide sequence cited and relied upon by the Examiner is not prior art because it was made publicly available (in the form cited by the Examiner) only after the priority date of the present application (i.e., January 1999).

Applicants found and herewith provide the revision history for Accession Number AC005586, and sequence data submitted to GenBank by Sulston et al. prior to the priority date of the present application. (See Appendices C-1 and C-2.) The revision history indicates that the sequence was first deposited with GenBank on September 1, 1998, with subsequent sequence revisions submitted on November 22, 1998, June 12, 2000, and September 30, 2000.

The September 1998 deposit, the earliest deposit, is a working draft of the Homo Sapiens clone DJ0584D14, and it consists of 18 arbitrarily ordered contigs with 17 gaps of unknown size

therebetween. The November 1998 deposit is also a working draft of the same clone, and it consists of 3 arbitrarily ordered contigs with 2 gaps of unknown size therebetween.

Notwithstanding that the Examiner has not met his burden of proof of establishing that the Sulston et al. references anticipate the subject matter of the pending claims, Applicants provide herewith, as Appendix D, a Declaration under 37 C.F.R. §1.131 of Nicholas H. Heintz, one of the co-inventors of the present application. The Declaration sets forth proof that Applicants had conception and reduction to practice of the subject matter of the rejected claims prior to the publication date of the Sulston GenBank submission in September 1998. Attached to the Declaration is Exhibit 1, the RIP60 nucleic acid sequence possessed by the inventor prior to September 1998; Exhibit 2, the RIP60 nucleic acid sequence as filed in the present invention; and Exhibit 3, a comparison of the sequences of Exhibits 1 and 2. Accordingly, Applicants believe that the rejection of claims 1-3 and 6-9 is obviated.

In view of the foregoing, Applicants respectfully request that the Examiner reconsider and withdraw the rejection of claims 1-3 and 6-9 under 35 U.S.C. §102(a) as being anticipated by Sulston et al. (Genome Research, 8(11):1097-1108, 1998).

Rejection under 35 U.S.C. §103(a)

The Examiner has maintained his rejection of claims 1-16 under 35 U.S.C. §103(a) as being unpatentable over Sulston et al. (Genome Research, 8(11):1097-1108, 1998). Previously, the Examiner stated that Sulston et al. disclose "the polynucleotide sequences recited SEQ ID NO:1, SEQ ID NO:3, SEQ ID NO:5 and 50 (and) consequently, said reference anticipates all the limitations of the instant claims". The Examiner further stated that although "Sulston et al. does not explicitly disclose incorporating said polynucleotides with a promoter in an expression vector, transfecting a host cells with said vector nor using said transformed cell to express the recombinant proteins recited in the instant claims ... it would be obvious to one of skill in the art to take a polynucleotide sequence, determine the open reading frames and incorporate it in a vector so the polypeptide encoded by said polynucleotide can be expressed cheaply and efficiently in a recombinant system."

Applicants respectfully traverse the rejection for the same reasons stated above under the 102(a) rejection.

In view of the foregoing, Applicants respectfully request that the Examiner reconsider and withdraw the rejection of now pending claims 1-6 and 8-16 under 35 U.S.C. §103(a) as being unpatentable over Sulston et al. (Genome Research, 8(11):1097-1108, 1998).

Summary

Applicants believe that each of the pending claims now is in condition for allowance. If the Examiner has any questions and believes that a telephone conference with Applicants' representative would prove helpful in expediting the prosecution of this application, the Examiner is urged to call the undersigned at (617) 720-3500 (ext. 266).

Respectfully submitted,

MMMAN

Maria A. Trevisan, Reg. No. 48,207

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600 Atlantic Avenue

Boston, MA 02210-2211

(617)720-3500

Attorney's Docket No.: V0139/7038 (HCL/MAT)

Date: February 8, 2002

x02/09/02

• Serial No.: 09/477,392

Art Unit: 1645

Express Mail No. EL844533597US Date of Deposit: February 8, 2002 DOCKET NO. V0139/7038/HCL/MAT

APPENDIX A:

MARKED-UP SPECIFICATION

Please re-write the paragraph beginning on page 22, line 9, as follows (noting that the new text has been indicated with a double underline to distinguish it from text that was original present in an underlined form and thus unchanged):

Homologs and alleles of the RIP60 nucleic acids of the invention can be identified by conventional techniques. Thus, an aspect of the invention is those nucleic acid sequences which code for RIP60 polypeptides and which hybridize to a nucleic acid molecule consisting of the coding region of SEQ ID NO:1, SEQ ID NO:3, SEQ ID NO:5 or SEQ ID NO:50 under stringent conditions. The term "stringent conditions" as used herein refers to parameters with which the art is familiar. Nucleic acid hybridization parameters may be found in references which compile such methods, e.g. Molecular Cloning: A Laboratory Manual, J. Sambrook, et al., eds., Second Edition, Cold Spring Harbor Laboratory Press, Cold Spring Harbor, New York, 1989, or Current Protocols in Molecular Biology, F.M. Ausubel, et al., eds., John Wiley & Sons, Inc., New York. More specifically, stringent conditions, as used herein, refers, for example, to hybridization at 65°C in hybridization buffer (3.5x SSC, 0.02% Ficoll, 0.02% polyvinyl pyrolidone, 0.02% Bovine Serum Albumin, 2.5mM NaH₂PO₄(pH7), 0.5% SDS, 2mM EDTA). SSC is 0.15M sodium chloride/[0.15M] 0.015M sodium citrate, pH7; SDS is sodium dodecyl sulphate; and EDTA is ethylenediaminetetracetic acid. After hybridization, the membrane upon which the DNA is transferred is washed at 2x SSC at room temperature and then at 0.1x SSC/0.1% SDS at temperatures up to 68°C.

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MARKED-UP CLAIMS

Please cancel claim 7. Please re-write the claims as shown below. A marked-up copy of the claims is attached to the end of this amendment as Appendix A.

- 1. (Twice Amended) An isolated nucleic acid molecule, comprising
- (a) a nucleic acid molecule which hybridizes under stringent conditions to a molecule consisting of a nucleic acid of SEQ ID NO:1, SEQ ID NO:3, SEQ ID NO:5, or SEQ ID NO:50 and which codes for a polypeptide having a RIP60 activity selected from the group consisting of DNA binding, protein multimerization, and nucleic acid looping,
- (b) a nucleic acid molecule that differs from the nucleic acid molecule of (a) in codon sequence due to the degeneracy of the genetic code, and
 - (c) complements of (a) or (b).

wherein the stringent conditions are hybridization at 65°C in hybridization buffer (3.5x SSC, 0.02% Ficoll, 0.02% polyvinyl pyrolidone, 0.02% Bovine Serum Albumin, 2.5mM NaH₂PO₄ (pH7), 0.5% SDS, 2mM EDTA); wherein SSC is 0.15M sodium chloride/0.015M sodium citrate, pH7; SDS is sodium dodecyl sulphate; and EDTA is ethylenediaminetetracetic acid.

- 2. The isolated nucleic acid molecule of claim 1, wherein the isolated nucleic acid molecule comprises SEQ ID NO:1.
- 3. The isolated nucleic acid molecule of claim 1, wherein the isolated nucleic acid molecule comprises SEQ ID NO:3, SEQ ID NO:5 or SEQ ID NO:50.
- 4. The isolated nucleic acid molecule of claim 1, wherein the isolated nucleic acid molecule codes for a polypeptide comprising SEQ ID NO:2.
- 5. The isolated nucleic acid molecule of claim 1, wherein the isolated nucleic acid molecule codes for a polypeptide comprising SEQ ID NO:4, SEQ ID NO:6 or SEQ ID NO:51.
- 6. (Twice Amended) An isolated nucleic acid molecule selected from the group consisting of
 - (a) a [unique] fragment of nucleic acid molecule of SEQ ID NO:1, and

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(b) complements of (a)[,

provided that the unique fragment includes a sequence of contiguous nucleotides other than the exact sequence of any sequence selected from the sequence group consisting of

- (1) sequences having the database accession numbers of Table 1, as published prior to January 4, 1999,
 - (2) complements of (1), and
 - (3) fragments of (1) and (2)].
- 8. (Amended) The isolated nucleic acid molecule of claim 6 [or 7], wherein the fragment has a size selected from the group consisting of at least: 8 nucleotides, 10 nucleotides, 12 nucleotides, 14 nucleotides, 16 nucleotides, 18 nucleotides, 20[,] nucleotides, 22 nucleotides, 24 nucleotides, 26 nucleotides, 28 nucleotides, 30 nucleotides, 50 nucleotides, 75 nucleotides, 100 nucleotides, and 200 nucleotides.
- 9. (Amended) The isolated nucleic acid molecule of claim 6 [or 7], wherein the [unique] fragment encodes a peptide which is a fragment of a polypeptide consisting of SEQ ID NO:2.
- 10. (Amended) The isolated nucleic acid molecule of claim 8, wherein the [unique] fragment encodes a peptide which is a fragment of a polypeptide consisting of SEQ ID NO:2.
- 11. An expression vector comprising the isolated nucleic acid molecule of claims 1, 2, 3, 4 or 5 operably linked to a promoter.
- 12. An expression vector comprising the isolated nucleic acid molecule of claim 9, operably linked to a promoter.
- 13. An expression vector comprising the isolated nucleic acid molecule of claim 10, operably linked to a promoter.
 - 14. A host cell transformed or transfected with the expression vector of claim 11.
 - 15. A host cell transformed or transfected with the expression vector of claim 12.

16. A host cell transformed or transfected with the expression vector of claim 13.

EGCTCAGGAT TTCTC LATAT CACAGACT



Nucleotide

Genome

Structure

PopSet

Talconomy

OMIM

Search Nucleotide for

Limits

Index

History

Clear

Clipboard

Display

Default View 🗖

as |HTML



Add to Clipboard

1: AC005586 Homo sapiens PAC clone RP4-584D14 from 7q31-q35, complete sequence

PubMed, Related Sequences, TaxonomyLinkOut

LOCUS

AC005586 132150 bp DNA

PRI

30-SEP-2000

DEFINITION

Homo sapiens PAC clone RP4-584D14 from 7q31-q35, complete sequence RECEIVED

ACCESSION

AC005586

VERSION

AC005586.2 GI:8468933

KEYWORDS SOURCE

HTG. human.

ORGANISM

Homo sapiens

Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi TECH CENTER 1600/2900 Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.

(bases 1 to 132150) REFERENCE 1

Sulston, J.E. and Waterston, R. AUTHORS

TITLE Toward a complete human genome sequence JOURNAL Genome Res. 8 (11), 1097-1108 (1998)

99063792 MEDLINE

REFERENCE (bases 1 to 132150)

AUTHORS Stoneking, T., Ozersky, P., Wohldmann, P. and Le, T. The sequence of Homo sapiens PAC clone RP4-584D14 TITLE

JOURNAL Unpublished

REFERENCE 3 (bases 1 to 132150)

AUTHORS Waterston, R.H.

Direct Submission TITLE

Submitted (01-SEP-1998) Genome Sequencing Center, Washington **JOURNAL**

University School of Medicine, 4444 Forest Park Parkway, St. Louis,

MO 63108, USA

REFERENCE 4 (bases 1 to 132150)

AUTHORS Waterston, R.H.

TITLE Direct Submission

JOURNAL Submitted (12-JUN-2000) Genome Sequencing Center, Washington

University School of Medicine, 4444 Forest Park Parkway, St. Louis,

MO 63108, USA

REFERENCE (bases 1 to 132150)

AUTHORS Waterston, R.

TITIE Direct Submission

JOURNAL Submitted (30-SEP-2000) Department of Genetics, Washington

University, 4444 Forest Park Avenue, St. Louis, Missouri 63108, USA

COMMENT On Jun 12, 2000 this sequence version replaced gi:3907529.

----- Genome Center

Center: Washington University Genome Sequencing Center

Center code: WUGSC

Web site: http://genome.wustl.edu/gsc Contact: sapiens@watson.wustl.edu ----- Summary Statistics

Center project name: H DJ0584D14

NOTICE: This sequence may not represent the entire insert of this clone. It may be shorter because we only sequence overlapping clone sections once, or longer because we provide a small overlap between neighboring data submissions.

This sequence was finished as follows unless otherwise noted: all regions were double stranded, sequenced with an alternate JUL 3 1 2001

chemistry, or covered by high quality data (i.e., phred quality >= 30); an attempt was made to resolve all sequencing problems, such as compressions and repeats; all regions were covered by sequence from more than one subclone; and the assembly was confirmed by restriction digest.

MAPPING INFORMATION:

The sequence of this clone was established as part of a mapping and sequencing collaboration between the NHGRI Chromosome 7 Mapping Project (Eric D. Green, Director), John D. McPherson in the Department of Genetics (Washington University), and the Washington University Genome Sequencing Center. For additional information about the map position of this sequence, see http://www.nhgri.nih.gov/DIR/GTB/CHR7 , send mailto:egreen@nhgri.nih.gov , or see http://genome.wustl.edu/gsc

SOURCE INFORMATION:

This clone was derived from human PAC library RPCI-4, prepared by Pieter de Jong and coworkers at the Roswell Park Cancer Institute (http://bacpac.med.buffalo.edu) using the method described by Ioannou et al., Nature Genetics 6:84-9 (1994). The library is from one male donor.

The clone may be obtained either from Genome Systems, Inc. (http://www.genomesystems.com) or Research Genetics, Inc.

(http://www.resgen.com); or from Pieter de Jong.

VECTOR: pCYPAC2

repeat region

NEIGHBORING SEQUENCE INFORMATION:

The clone sequenced to the right is RP5-820A21, 200 base pair overlap. Actual start of this clone is at base position 1 of RP4-584D14; actual end is at base position 131954 of RP4-584D14.

The sequence RP4-584D14 from base position 21655 to 22775 is GT rich. This region was sized with PCR from genomic DNA and the hindiii digest with band size 3643 real, and 3642 insilico. sequence RP4-584D14 from base position 22628 to 22637 is represented by sequence derived by PCR from genomic DNA.

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misc feature
                /note="similar to EST AI570541 (NID:g4533915) tm77h03.x1"
misc feature
                9804..10155
                /note="similar to EST AW005172 (NID:g5853950) wz84b01.x1"
                9804..10168
misc feature
                /note="similar to EST AA262035 (NID:g1898226) zs21e01.s1"
misc feature
                9804..10266
                /note="similar to EST AA478979 (NID:g2205342) zu39b04.s1"
                9804..10266
misc feature
                /note="similar to EST AI274899 (NID:g3897173) qk61h06.x1"
misc feature
                9805..9954
                /note="similar to EST AI242577 (NID:g3837974) qi17e02.x1"
                9805..10317
misc feature
                /note="similar to EST AW027740 (NID:g5886496) wv75g08.x1"
misc feature
                9805..10068
                /note="similar to EST AI383384 (NID:g4196165) tc97a05.x1"
                9805..10110
misc feature
                /note="similar to EST AA662653 (NID:g2616644) nu99h04.s1"
misc feature
                9805..10140
                /note="similar to EST AI660300 (NID:g4763870) we66a08.x1"
misc feature
                9805..10521
                /note="similar to EST AI014570 (NID:g3228951) ou40h08.x1"
misc feature
                /note="similar to EST W93039 (NID:g1422210) zd93e04.s1"
misc feature
                9806..10277
                /note="similar to EST H96782 (NID:g1110268) yw98b03.s1"
misc feature
                9807..10159
                /note="similar to EST AA975613 (NID:g3151405) oq41f09.s1"
misc feature
                9807..10266
                /note="similar to EST AA909314 (NID:g3048719) om34b11.s1"
misc feature
                9815..10451
                /note="similar to EST AI631828 (NID:g4683158) wa36f05.x1"
                9820..10162
misc feature
                /note="match to EST AA813953 (NID:g2883549) oc06f02.s1"
                9820..10338
misc feature
                /note="similar to EST AA742283 (NID:g2784283) ny28f10.s1"
                9820..10291
misc feature
                /note="match to EST AA806412 (NID:g2875162) oc27c10.s1"
misc feature
                9836..10388
                /note="similar to EST AW303355 (NID:g6713035) xv18b02.x1"
                9843..10365
misc feature
                /note="similar to EST AA837494 (NID:g2912693) od20h07.s1"
repeat region
                10001..10048
                /rpt family="GC rich"
                10037..10468
misc feature
                /note="match to EST AA478214 (NID:g2206848) zu40f07.r1"
misc feature
                10066..10068
                /note="match to EST R06319 (NID:g756939) yf08c08.r1"
                10081..10741
misc feature
                /note="similar to EST AW411280 (NID:g6936821) fh11d05.x1"
misc feature
                10314..10468
                /note="match to EST AA477916 (NID:g2206550) zu39b04.r1"
misc feature
                10355..10697
                /note="similar to Mus musculus EST AA981950 (NID:g3160719)
                ua37c04.r1"
                10357..10890
misc feature
                /note="match to EST AA280069 (NID:g1921543) zs93d12.r1"
misc feature
                10544..10697
                /note="similar to EST AI242577 (NID:g3837974) qi17e02.x1"
misc feature
                10601..10697
                /note="similar to Mus musculus EST W08046 (NID:g1282049)
                mb38c12.r1"
misc feature
                10642..10701
                /note="match to EST R71963 (NID:g845995) yj84d08.r1"
misc feature
                10778..10927
                /note="similar to EST AW016068 (NID:g5864825)"
misc feature
                10845..11142
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/note="match to EST AA077571 (NID:g1837045)"
                11044..11165
misc feature
                /note="match to EST R71963 (NID:g845995) yj84d08.r1"
                11083..11373
misc feature
                /note="similar to EST AW504279 (NID:g7141946)"
                11163..11290
repeat region
                /rpt_family="MIR"
                1117\overline{7}..11433
misc feature
                /note="similar to EST AI660300 (NID:g4763870) we66a08.x1"
                11390..11581
misc feature
                /note="similar to EST AI373014 (NID:g4152880) qz02g01.x1"
misc feature
                11390..11581
                /note="similar to EST AI934673 (NID:g5673543) wp87g08.x1"
                11632..11854
misc feature
                /note="similar to EST AW075108 (NID:g6030106) xa68c07.x1"
                12057..12254
misc feature
                /note="similar to Mus musculus EST W08046 (NID:g1282049)
                mb38c12.r1"
misc feature
                12057..12254
                /note="match to EST R71963 (NID:g845995) yj84d08.r1"
misc feature
                12663..13844
                /note="CpG island (%GC=71.3, o/e=0.90, #CpGs=138)"
misc feature
                12793..13135
                /note="similar to EST AL046625 (NID:g5434691)"
                12934..12980
repeat region
                /rpt family="GC rich"
misc feature
                12984..13111
                /note="similar to Mus musculus EST AA981950 (NID:g3160719)
                ua37c04.r1"
misc feature
                12984..13040
                /note="match to EST R71963 (NID:g845995) yj84d08.r1"
misc feature
                12984..13033
                /note="similar to EST AI242577 (NID:g3837974) qi17e02.x1"
misc feature
                12984..13081
                /note="similar to Mus musculus EST W08046 (NID:g1282049)
                mb38c12.r1"
                13177..13246
repeat region
                /rpt family="GC rich"
                13594..14074
misc feature
                /note="similar to EST AI912005 (NID:g5631860) wd78f12.x1"
repeat region
                14346..14501
                /rpt_family="L1"
                14619..14915
repeat region
                /rpt family="Alu"
                14987..14998
repeat region
                /rpt_family="Alu"
                14999..15049
repeat region
                /rpt_family="(TTTA)n"
                15050..15333
repeat region
                /rpt_family="Alu"
                15622..16162
repeat region
                /rpt family="MER4-group"
misc feature
                15702..15706
                /note="match to EST AA129215 (NID:g1689084) zn84b02.s1"
                16163..16456
repeat region
                /rpt_family="Alu"
                16457..16620
repeat region
                /rpt_family="MER4-group"
                16757..17068
repeat region
                /rpt family="Alu"
                17268..17501
repeat region
                /rpt family="MIR"
                18315..18407
repeat region
                /rpt family="L2"
misc feature
                18483..18956
                /note="match to EST AA451648 (NID:g2165317) zx43e05.r1"
```

misc feature

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/note="similar to EST AW195520 (NID:g6474650) xn39e04.x1"
                 18830..19325
repeat region
                 /rpt family="MER21-group"
                 19711..19877
repeat region
                 /rpt family="L2"
                 19988..20144
repeat region
                 /rpt_family="L2"
                 20148..20391
repeat region
                 /rpt family="MaLR"
repeat region
                 20508..20671
                 /rpt_family="MER4-group"
                 20672..20711
repeat region
                 /rpt_family="(TTTTA)n"
                 2071\overline{2}..20989
repeat region
                 /rpt_family="Alu"
repeat region
                 20996..21103
                 /rpt_family="MER4-group"
repeat region
                 21104..21371
                 /rpt_family="Alu"
                 21372..21413
repeat region
                 /rpt_family="(TATATG)n"
repeat region
                 21414..21663
                 /rpt family="MER4-group"
                 21682..21859
repeat region
                 /rpt family="(TG)n"
                 22043..22274
repeat region
                 /rpt_family="(TG)n"
                 22322..22497
repeat region
                 /rpt_family="(GTGTG)n"
                 2261\overline{0}..22772
repeat_region
                 /rpt_family="(GTGTG)n"
                 22776..22953
repeat_region
                 /rpt family="MER4-group"
                 22957..23066
repeat region
                 /rpt family="MaLR"
                 23107..23303.
repeat region
                 /rpt_family="L2"
                 2330\overline{3}..23390
repeat region
                 /rpt_family="L2"
                 23480..23612
repeat_region
                 /rpt family="Alu"
                 23519..23841
misc_feature
                 /note="match to EST T96609 (NID:g735233) ye51d03.s1"
misc feature
                 23819..24212
                 /note="match to EST T96719 (NID:g735343) ye51d03.r1"
                 24755..24847
repeat region
                 /rpt_family="(TTATA)n"
repeat region
                 25094..25171
                 /rpt family="HY4"
repeat region
                 25343..25648
                 /rpt_family="Alu"
                 25347..25366
misc feature
                 /note="similar to EST AA199876 (NID:g1795583) zq52f04.s1"
                 25360..25372
misc feature
                 /note="match to EST AA805585 (NID:g2874285) oc18b08.s1"
                 25657..25793
repeat region
                 /rpt family="MaLR"
repeat region
                 25992..26076
                 /rpt family="LTR54"
                 26077..26277
repeat region
                 /rpt_family="MER4-group"
                 26303..26696
repeat region
                 /rpt family="MER4-group"
                 26711..26894
repeat region
                 /rpt_family="Alu"
                 26895..27166
repeat region
                 /rpt_family="Alu"
```

```
27167..27273
repeat region
                 /rpt family="Alu"
                 2754\overline{1}..27614
repeat region
                 /rpt_family="L2"
                 2761\overline{3}..27619
misc feature
                 /note="similar to EST AA814848 (NID:g2884444) oc05g05.s1"
repeat region
                 28006..28307
                 /rpt family="Alu"
                 28308..28386
repeat region
                 /rpt family="Other"
                 28528..28642
repeat region
                 /rpt family="Other"
                 28676..28965
repeat_region
                 /rpt_family="Alu"
                 28974..29020
repeat region
                 /rpt_family="Other"
                 29045..29073
repeat region
                 /rpt_family="AT_rich"
                 29111..29426
repeat region
                 /rpt_family="Alu"
                 29454..29843
repeat region
                 /rpt_family="L1"
                 29607..29611
misc feature
                 /note="match to EST H11135 (NID:g875955) ym09b02.r1"
                 30041..30213
repeat region
                 /rpt family="Alu"
                 30244..30313
repeat region
                 /rpt family="L1"
                 30374..30757
repeat region
                 /rpt family="L1"
                 30800..31053
repeat region
                 /rpt family="Alu"
                 31106..31290
repeat region
                 /rpt family="Alu"
                 31328..31477
repeat region
                 /rpt family="L1"
                 31478..31774
repeat region
                 /rpt_family="Alu"
                 3177\overline{5}..31812
<u>repeat_region</u>
                 /rpt family="(TA)n"
                 31813..31979
repeat region
                 /rpt_family="L1"
                 31980..32280
repeat_region
                 /rpt_family="Alu"
                 32281..32616
repeat region
                 /rpt family="L1"
                 complement (32657..32879)
STS
                 /db xref="GI:292544"
                 32823..32850
repeat region
                 /rpt family="(TTTG)n"
repeat region
                 32851..33014
                 /rpt family="Alu"
                 33135..33172
repeat region
                 /rpt_family="AT rich"
                 33723..33933
repeat region
                 /rpt family="MaLR"
                 33935..33973
repeat region
                 /rpt family="(TTTA)n"
repeat region
                 33974..34255
                 /rpt family="Alu"
misc feature
                 34118..34133
                 /note="match to EST AA582540 (NID:g2359900) nn55a06.s1"
repeat region
                 34256..34366
                 /rpt family="MaLR"
                 34367..34655
repeat region
                 /rpt_family="Alu"
```

repeat region

```
/rpt family="(GGAA)n"
                34871..35653
repeat region
                /rpt_family="L2"
repeat region
                35663..35980
                /rpt family="Alu"
repeat region
                36021..36308
                /rpt_family="Alu"
                36559..36630
repeat region
                /rpt family="MER1 type"
                36632..36976
repeat region
                /rpt_family="MER1_type"
                37028..37088
repeat region
                /rpt_family="Alu"
repeat region
                37089..37328
                /rpt_family="Alu"
misc feature
                37206..37221
                /note="match to EST AI144038 (NID:g3665847) qi63b05.x1"
misc feature
                37210..37221
                /note="similar to EST AA031509 (NID:g1501463) zk13a09.s1"
misc feature
                37210..37221
                /note="match to EST AI053787 (NID:g3321574) qi70a03.x1"
misc feature
                37210..37221
                /note="match to EST AA835735 (NID:g2910054) od66f10.s1"
                37339..37902
repeat region
                /rpt family="MER1 type"
                38075..38240
repeat region
                /rpt family="L2"
                38341..38425
repeat region
                /rpt family="MER4-group"
repeat region
                38434..38549
                /rpt family="Alu"
                38561..38667
repeat region
                /rpt family="MER21-group"
repeat region
                38668..39015
                /rpt family="MER4-group"
                39296..39414
repeat region
                /rpt_family="MIR"
misc feature
                39318..39364
                /note="match to EST AA159496 (NID:g1735039) zo72b05.s1"
misc feature
                39365..39701
                /note="match to EST AA159496 (NID:g1735039) zo72b05.s1"
                39562..40154
misc feature
                /note="match to EST AA161506 (NID:g1735816) zo72b05.r1"
misc feature
                39983..41554
                /note="CpG island (%GC=69.3, o/e=0.70, #CpGs=111)"
                40197..40329
repeat region
                /rpt family="L2"
misc feature
                40234
                /note="match to EST H84693 (NID:g1063912) ys70b04.r1"
misc feature
                40279..40347
                /note="match to EST W07009 (NID:g1281013) za91f02.r1"
                40281..40347
misc feature
                /note="match to EST H84693 (NID:g1063912) ys70b04.r1"
                40285..40347
misc feature
                /note="match to EST AA297719 (NID:g1950053)"
misc feature
                40378..40380
                /note="match to EST AA507194 (NID:g2243633) nh43f08.s1"
misc feature
                41237..41489
                /note="similar to EST AW655938 (NID:g7421764)"
misc feature
                41282..41489
                /note="similar to EST AW483984 (NID:g7054090)"
                41296..41489
misc feature
                /note="match to EST H84693 (NID:g1063912) ys70b04.r1"
misc feature
                41296..41490
                /note="match to EST AA297719 (NID:g1950053)"
misc feature
                41296..41489
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/note="match to EST W07009 (NID:g1281013) za91f02.r1"

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misc feature
                41303..41489
                /note="match to EST W37661 (NID:g1319254) zc12e08.rl"
                41316..41489
misc feature
                /note="similar to EST AI301886 (NID:g3961232) gn56e01.x1"
misc feature
                41351..41489
                /note="similar to EST AI192960 (NID:g3744169) qe68g08.x1"
misc feature
                41377..41489
                /note="similar to EST AI953803 (NID:g5746113) wx69f03.x1"
misc feature
                41424..41825
                /note="match to EST AA481944 (NID:g2209622) zv43a07.rl"
misc feature
                41427..41489
                /note="similar to EST AI702025 (NID:g4989925) tg20d09.x1"
misc feature
                41433..41774
                /note="similar to EST AA292312 (NID:g1940308) zt51b01.r1"
misc feature
                41462..41489
                /note="similar to EST AI335981 (NID:g4072908) qt49g04.x1"
misc feature
                41466..41488
                /note="match to EST AA846256 (NID:g2932396) ai83g05.s1"
misc feature
                41685..41825
                /note="match to EST AA482067 (NID:g2209745) zv43a07.s1"
misc feature
                41712..41825
                /note="match to EST N62038 (NID:g1208189)"
misc feature
                41720..41825
                /note="match to EST AA995263 (NID:g3181752) os19g11.s1"
misc feature
                41720..41825
                /note="match to EST W37475 (NID:g1319136) zc12e08.s1"
misc feature
               41721..41825
                /note="similar to EST AW655938 (NID:g7421764)"
misc feature
               41721..41825
                /note="match to EST W37661 (NID:g1319254) zc12e08.rl"
misc_feature
                41721..41825
                /note="similar to EST AI702025 (NID:g4989925) tq20d09.x1"
                41721..41825
misc feature
                /note="match to EST AA507194 (NID:g2243633) nh43f08.s1"
misc feature
                /note="similar to EST AI953803 (NID:g5746113) wx69f03.x1"
misc feature
                41721..41794
                /note="match to EST H84693 (NID:g1063912) ys70b04.r1"
misc feature
                41721..41825
                /note="similar to EST AI335981 (NID:g4072908) qt49g04.x1"
                41721..41825
misc_feature
                /note="match to EST AA846256 (NID:g2932396) ai83g05.s1"
misc feature
                41721..41825
                /note="match to EST W07009 (NID:g1281013) za91f02.r1"
                41721..41825
misc feature
                /note="match to EST AI096654 (NID:g3446148) qb36a10.x1"
misc feature
                41721..41825
                /note="similar to EST AI192960 (NID:g3744169) qe68g08.x1"
misc feature
                41721..41825
                /note="similar to EST AI301886 (NID:g3961232) qn56e01.x1"
misc feature
                41721..41825
                /note="similar to EST AW483984 (NID:g7054090)"
<u>misc</u> feature
                41737...41825
                /note="match to EST AA449630 (NID:g2163380) zx08f01.r1"
misc feature
                41796..41825
                /note="similar to EST AI286253 (NID:g3924486) qu91a01.x1"
misc feature
                42843..42939
                /note="match to EST AA976115 (NID:g3151907) on33b08.s1"
                42844..42939
misc feature
                /note="match to EST AI096654 (NID:g3446148) qb36a10.x1"
misc feature
                42844..42940
                /note="similar to EST AW483984 (NID:g7054090)"
misc feature
                42844..42944
                /note="match to EST W07009 (NID:g1281013) za91f02.r1"
<u>misc</u> feature
                42844..42939
                /note="similar to EST AI335981 (NID:g4072908) qt49g04.x1"
```

misc feature

42844..42939

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/note="similar to EST AI286253 (NID:g3924486) qu91a01.x1"
misc feature
                42844..42939
               /note="match to EST AA846256 (NID:g2932396) ai83g05.s1"
misc feature
                42844..42939
               /note="similar to EST AI702025 (NID:g4989925) tq20d09.x1"
misc feature
                42844..42939
               /note="match to EST W37475 (NID:g1319136) zc12e08.s1"
misc feature
               42844..42939
               /note="match to EST AA482067 (NID:g2209745) zv43a07.s1"
misc feature
               42844..42939
               /note="similar to EST AI301886 (NID:g3961232) qn56e01.x1"
misc feature
               42844..42939
                /note="match to EST AA995263 (NID:g3181752) os19g11.s1"
misc feature
               42844..42939
                /note="similar to EST AI192960 (NID:g3744169) qe68g08.x1"
misc feature
               42844..42939
                /note="match to EST AA449630 (NID:g2163380) zx08f01.r1"
misc feature
               42844..42939
                /note="match to EST AA507194 (NID:g2243633) nh43f08.s1"
misc feature
               42844..42939
                /note="match to EST N62038 (NID:g1208189)"
misc feature
               42844..42939
                /note="match to EST AA481944 (NID:g2209622) zv43a07.rl"
misc feature
               42844..42939
                /note="similar to EST AW655938 (NID:g7421764)"
misc feature
               42844..42939
               /note="match to EST W37661 (NID:g1319254) zc12e08.r1"
misc feature
               42844..42939
               /note="similar to EST AI953803 (NID:g5746113) wx69f03.x1"
               42850..42939
misc feature
               /note="match to EST W60571 (NID:g1367548) zd26g05.r1"
misc_feature
               42851..42939
               /note="match to EST AA297373 (NID:g1949706)"
misc feature
                /note="similar to EST AI886213 (NID:g5591377) wm08a12.x1"
misc feature '
               42889..42939
               /note="similar to EST AW135940 (NID:g6140073)"
               42896..42939
misc feature
               /note="match to EST AI092081 (NID:g3431075) qa93f01.s1"
               43065..43067
misc feature
               /note="match to EST AA548797 (NID:g2319079) nk02f03.s1"
               43184..43295
misc feature
               /note="similar to EST AI301886 (NID:g3961232) qn56e01.x1"
misc feature
               43184..43295
               /note="match to EST AA995263 (NID:g3181752) os19g11.s1"
<u>misc feature</u>
                43184..43290
                /note="match to EST AI092081 (NID:g3431075) qa93f01.s1"
misc feature
                43184..43257
                /note="match to EST N62038 (NID:g1208189)"
misc feature
                43184..43269
               /note="match to EST AA481944 (NID:g2209622) zv43a07.r1"
misc feature
                43184..43309
               /note="match to EST W37661 (NID:g1319254) zc12e08.rl"
misc feature
               43184..43285
               /note="similar to EST AW655938 (NID:g7421764)"
               43184..43310
misc feature
               /note="similar to EST AI335981 (NID:g4072908) qt49g04.x1"
misc feature
                43184..43310
               /note="similar to EST AI286253 (NID:g3924486) qu91a01.x1"
               43184..43310
misc feature
               /note="similar to EST AI886213 (NID:g5591377) wm08a12.x1"
misc feature
               43184..43310
                /note="match to EST AA846256 (NID:g2932396) ai83g05.s1"
misc feature
               43184..43310
               /note="similar to EST AW135940 (NID:g6140073)"
misc feature
               43184..43310
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/note="similar to EST AI702025 (NID:g4989925) tq20d09.x1"

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misc feature
                43184..43310
                /note="match to EST AI096654 (NID:g3446148) qb36a10.x1"
misc feature
                43184..43310
                /note="match to EST W37475 (NID:g1319136) zc12e08.s1"
misc feature
                43184..43310
                /note="match to EST AA482067 (NID:g2209745) zv43a07.s1"
misc feature
                43184..43310
                /note="similar to EST AI192960 (NID:g3744169) qe68g08.x1"
misc feature
                43184..43310
                /note="match to EST AA976115 (NID:g3151907) on33b08.s1"
misc feature
                43184..43310
                /note="match to EST AA297373 (NID:g1949706)"
misc feature
                43184..43310
                /note="match to EST AA449630 (NID:g2163380) zx08f01.r1"
misc feature
                43184..43310
                /note="match to EST AA507194 (NID:g2243633) nh43f08.s1"
misc feature
                43184..43310
                /note="match to EST W60571 (NID:g1367548) zd26g05.r1"
misc feature
                43184..43310
                /note="similar to EST AI953803 (NID:g5746113) wx69f03.x1"
misc feature
                43211..43310
                /note="match to EST AA548797 (NID:g2319079) nk02f03.s1"
misc feature
                43240..43310
                /note="match to EST AA614395 (NID:g2466591) np46e02.s1"
misc feature
                43484..43595
                /note="match to EST W60571 (NID:g1367548) zd26g05.r1"
misc feature
                43486..43607
                /note="similar to EST AI886213 (NID:g5591377) wm08a12.x1"
                43486..43600
misc feature
                /note="match to EST AA846256 (NID:g2932396) ai83g05.s1"
misc_feature
                43486..43602
                /note="similar to EST AI702025 (NID:g4989925) tq20d09.x1"
misc feature
                43486..43603
                /note="match to EST AI096654 (NID:g3446148) qb36a10.x1"
misc feature
                43486..43609
                /note="match to EST AA482067 (NID:g2209745) zv43a07.s1"
               43486..43596
misc feature
                /note="similar to EST AI335981 (NID:g4072908) qt49g04.x1"
                43486..43596
misc_feature
                /note="similar to EST AI286253 (NID:g3924486) qu91a01.x1"
misc feature
                43486..43596
                /note="similar to EST AW135940 (NID:g6140073)"
                43486..43596
misc feature
                /note="similar to EST AI192960 (NID:g3744169) qe68q08.x1"
misc feature
                43486..43594
                /note="match to EST AA976115 (NID:g3151907) on33b08.s1"
misc feature
                43486..43594
                /note="match to EST AA614395 (NID:g2466591) np46e02.s1"
misc feature
                43486..43540
                /note="match to EST AA297373 (NID:g1949706)"
misc feature
                43486..43597
                /note="match to EST AA548797 (NID:g2319079) nk02f03.s1"
                43486..43597
<u>misc feature</u>
                /note="match to EST W37475 (NID:g1319136) zc12e08.s1"
misc feature
                43486..43597
                /note="match to EST AA449630 (NID:g2163380) zx08f01.r1"
misc feature
                43486..43599
                /note="match to EST AA507194 (NID:g2243633) nh43f08.s1"
misc feature
                43486..43595
                /note="similar to EST AI953803 (NID:g5746113) wx69f03.x1"
misc feature
                43767..44115
                /note="match to EST AI144038 (NID:g3665847) qi63b05.x1"
misc feature
                43769..43926
                /note="similar to EST AI800018 (NID:g5365490) wc41f01.x1"
misc feature
                43769..44049
                /note="match to EST AA838544 (NID:g2913343) oe39c02.s1"
```

misc feature

43769..44231

```
/note="match to EST R51319 (NID:g813221) yg72f04.s1"
                43769..43961
misc <u>feature</u>
                /note="match to EST AI053787 (NID:g3321574) qi70a03.x1"
                43770..43878
misc feature
                /note="similar to EST AI937338 (NID:g5676208) wp76a04.x1"
                43771..43952
misc feature
                /note="match to EST AA805535 (NID:g2874285) oc18b08.s1"
misc feature
                43772..44107
                /note="similar to EST AI349626 (NID:g4086832) ta74h08.x2"
                43775..44077
misc feature
                /note="match to EST N80586 (NID:g1243287) zb02e06.s1"
misc feature
                43775..44192
                /note="match to EST R49133 (NID:g820202) yg69f08.s1"
                43775..44090
<u>misc feature</u>
                /note="match to EST AA582540 (NID:g2359900) nn55a06.s1"
                43777..44214
misc feature
                /note="match to EST H41438 (NID:g917490) yp72h06.s1"
                43786..44107
misc feature
                /note="similar to EST AW271143 (NID:g6658173) xr49e02.x1"
               44075..44391
misc feature
                /note="match to EST AA805535 (NID:g2874285) oc18b08.s1"
                44217..44607
misc feature
                /note="similar to EST AI732196 (NID:g5053309) ne09f10.x5"
misc feature
                44227..44300
                /note="match to EST N80586 (NID:g1243287) zb02e06.s1"
misc feature
                44228..44229
                /note="match to EST R49133 (NID:g820202) yg69f08.s1"
misc feature
                44248..44536
                /note="match to EST AA077645 (NID:g1837329)"
                44257..44593
misc feature
                /note="similar to EST AI937338 (NID:g5676208) wp76a04.x1"
                44563..45013
misc feature
                /note="match to EST R51431 (NID:g813333) yg72f04.r1"
misc feature 44770..45207
                /note="similar to EST AI807218 (NID:g5393784) wf38b11.x1"
misc feature
                44789..45175
                /note="similar to EST AI807212 (NID:g5393778) wf38b05.x1"
misc feature
                44850..45207
                /note="similar to EST AI821213 (NID:g5440292) ne09f10.y5"
misc feature
                44940..45197
                /note="match to EST AA295306 (NID:g1947641)"
                46869..47188
repeat region
                /rpt_family="Alu"
misc feature
                46870..46897
                /note="match to EST AA805365 (NID:g2874115) oc15f09.s1"
repeat region
                48454..48665
                /rpt_family="MER1_type"
misc feature
                49193..49399
                /note="match to EST AA805365 (NID:g2874115) oc15f09.s1"
misc feature
                49201..49448
                /note="similar to EST AI702308 (NID:g4990208) tz36g12.x1"
                49201..49609
misc feature
                /note="match to EST AI027467 (NID:g3244983) ow06c10.x1"
                49201..49526
misc feature
                /note="match to EST AA835735 (NID:g2910054) od66f10.s1"
misc feature
                49204..49757
                /note="similar to EST AI762857 (NID:g5178524) wi63b04.x1"
misc feature
                49204..49476
                /note="similar to EST AI244028 (NID:g3839425) qj62c01.x1"
misc feature
                49204..49683
                /note="similar to EST AI949997 (NID:g5742307) wq15d01.x1"
                49672..49984
misc feature
                /note="match to EST AA169345 (NID:g1748303) zp17e12.s1"
misc feature
                50192..50536
                /note="match to EST T81965 (NID:g704972) yd94h11.r1"
misc feature
                50695..50700
                /note="match to EST H41438 (NID:g917490) yp72h06.s1"
```

```
52748..52893
misc feature
                /note="similar to EST AA199876 (NID:g1795583) zq52f04.s1"
                52753..52893
<u>misc</u> feature
                /note="similar to EST AA207191 (NID:g1802683) zq73f05.r1"
                53464..53889
misc feature
                /note="similar to EST AA121611 (NID:g1679226) zn78c08.rl"
                53924..54089
misc feature
                /note="similar to EST AI080470 (NID:g3416721) os71c05.x1"
                54088..54107
misc feature
                 /note="similar to EST AA121611 (NID:g1679226) zn78c08.r1"
repeat region
                54089..54387
                 /rpt family="Alu"
                54390..54766
misc feature
                 /note="similar to EST AA101325 (NID:g1648130) zn73a10.s1"
<u>misc feature</u>
                54401..54760
                 /note="similar to EST AI080470 (NID:g3416721) os71c05.x1"
                54534..54754
misc feature
                 /note="similar to EST AA728785 (NID:g2750144) nx37h10.s1"
                54766..54776
misc feature
                 /note="match to EST W37475 (NID:g1319136) zc12e08.s1"
                 55225..55523
repeat region
                 /rpt family="Alu"
                 5524\overline{1..55714}
misc feature
                 /note="similar to EST AI355155 (NID:g4095308) qt80g02.x1"
                 55642..55691
repeat region
                 /rpt_family="L2"
                 55915..56054
misc feature
                 /note="similar to EST AI821213 (NID:g5440292) ne09f10.y5"
                55915..55950
misc feature
                 /note="similar to EST AI807218 (NID:g5393784) wf38b11.x1"
                 56154..56450
repeat region
                 /rpt family="Alu"
                56897..57043
repeat region
                 /rpt family="L2"
                 57187..57364
repeat region
                 /rpt_family="L2"
                 58089..58230
repeat region
                 /rpt family="MIR"
                 58262..59063
misc feature
                 /note="CpG_island (%GC=70.3, o/e=0.80, #CpGs=82)"
                 58469..58496
repeat region
                 /rpt_family="GC_rich"
                 59095..59713
repeat region
                 /rpt family="MER4-group"
                 complement (59753..59931)
STS
                 /db xref="GI:3800635"
misc feature
                 59753..59931
                 /note="match to EST AA078521 (NID:g1838009)"
                 60160..60466
repeat region
                 /rpt_family="Alu"
                 60589..60796
repeat region
                 /rpt_family="MER4-group"
                 60783..60807
repeat region
                 /rpt family="MER4-group"
repeat region
                 6080\overline{8}..60970
                 /rpt family="MER4-group"
                 60997..61139
repeat region
                 /rpt_family="MER4-group"
repeat region
                 61140..61443
                 /rpt family="Alu"
                 61444..61802
repeat region
                 /rpt_family="MER4-group"
                 62248..62299
repeat region
                 /rpt_family="L2"
                 62419..62725
repeat region
                 /rpt_family="Alu"
```

<u>misc feature</u>

```
/note="match to EST AA846256 (NID:g2932396) ai83g05.s1"
                62872..62911
repeat region
                /rpt_family="L2"
                6292\overline{8}..63035
repeat region
                /rpt_family="MER1_type"
repeat region
                62934..63047
                /rpt family="MER1 type"
repeat region
                63154..63180
                /rpt family="(TTG)n"
                63181..63221
repeat region
                /rpt family="Alu"
                63222..63442
repeat region
                /rpt_family="Alu"
                63472..63671
repeat region
                /rpt_family="MaLR"
                63672..64071
repeat region
                /rpt family="MER90"
                63940..63944
misc feature
                /note="similar to EST AI080470 (NID:g3416721) os71c05.x1"
                64072..64525
repeat region
                /rpt family="L1"
                64216..64220
misc feature
                /note="similar to EST AA728785 (NID:g2750144) nx37h10.s1"
                64573..64822
repeat region
                /rpt family="Alu"
repeat region
                64884..65141
                /rpt family="L1"
repeat region
                65142..65444
                /rpt_family="Alu"
                65445..65649
repeat region
                /rpt_family="L1"
                65660..65700
repeat region
                /rpt family="L1"
                65705..66008
repeat region
                /rpt family="Alu"
repeat region
                66436..66524
                /rpt family="L1"
                66496..66671
repeat region
                /rpt family="L1"
                66669...66747
repeat region
                /rpt_family="L1"
                66776..66950
repeat region
                /rpt family="MER1 type"
                66954..67264
repeat region
                /rpt_family="Alu"
                67271..67299
repeat region
                /rpt_family="AT rich"
repeat region
                68194..68633
                /rpt family="MER4-group"
                68639..69108
repeat region
                /rpt family="Retroviral"
                69117..69137
repeat region
                /rpt family="AT rich"
                69382..69588
misc feature
                /note="similar to EST AW188096 (NID:g6462532) xj92c11.x1"
                69382..69648
misc feature
                /note="similar to EST AA031509 (NID:g1501463) zk13a09.s1"
                69383..69648
misc feature
                /note="similar to EST AI032905 (NID:g3253858) ox19e05.s1"
                69389..69648
misc feature
                /note="similar to EST R77178 (NID:g851810) yi65d05.r1"
                69642..69760
repeat region
                /rpt_family="Retroviral"
                69803..72426
repeat region
                /rpt_family="Retroviral"
                72025..72124
misc feature
                /note="similar to EST AW188096 (NID:g6462532) xj92c11.x1"
```

```
repeat region
                 72451..74221
                 /rpt family="Retroviral"
                 74075..74229
misc feature
                 /note="similar to EST AW188096 (NID:g6462532) xj92c11.x1"
repeat region
                 74222..74685
                 /rpt family="Retroviral"
                 74687..74850
repeat region
                 /rpt family="MER4-group"
                 74890..75112
repeat region
                 /rpt family="L1"
                 75246..75359
repeat region
                 /rpt_family="Alu"
                 76347..76448
repeat region
                 /rpt_family="L2"
                 77147..77438
repeat region
                 /rpt_family="L2"
                 78090..78319
misc feature
                 /note="match to EST Y08472 (NID:g1620944)"
                 78095..78133
repeat region
                 /rpt family="HY1"
                 78436..78541
repeat region
                 /rpt_family="MaLR"
repeat region
                 78517..78824
                 /rpt family="MaLR"
                 79695..79857
repeat_region
                 /rpt family="L1"
                 79895..80278
repeat region
                 /rpt family="L1"
                 80365..80428
repeat region
                 /rpt family="L2"
                 8064\overline{0}..80723
repeat region
                 /rpt family="L2"
                 80818..80963
repeat region
                 /rpt family="MIR"
                 8154\overline{5}..81854
repeat region
                 /rpt family="Alu"
                 81931..82124
repeat region
                 /rpt_family="L1"
                 8212\overline{5}..82420
repeat region
                 /rpt_family="Alu"
                 82445..82608
repeat_region
                 /rpt family="Alu"
repeat_region
                 82644..82950
                 /rpt_family="Alu"
                 83277..83495
repeat region
                 /rpt family="MIR"
repeat region
                 8405\overline{3}..84354
                 /rpt_family="Alu"
                 84564..84697
repeat region
                 /rpt family="L1"
                 84700..84821
repeat region
                 /rpt_family="Other"
                 8484\overline{8}..85054
repeat region
                 /rpt family="MaLR"
                 85105..85276
repeat region
                 /rpt_family="MaLR"
                 85558..85853
repeat region
                 /rpt family="Alu"
misc feature
                 86567..86673
                 /note="similar to EST Y08714 (NID:g1620957)"
                 86567..86673
misc feature
                 /note="similar to EST Y08709 (NID:g1620946)"
misc_feature
                 86569..86673
                 /note="similar to EST AW491691 (NID:g7061972)"
                 86578..86673
misc feature
                 /note="match to EST H11135 (NID:g875955) ym09b02.r1"
```

repeat region

```
/rpt family="MER103"
                87485..87561
repeat region
                /rpt family="MER1_type"
                87565..87770
repeat region
                /rpt_family="MER1_type"
                87774..87886
<u>repeat region</u>
                /rpt family="MER1 type"
repeat region
                87960..88263
                /rpt family="Alu"
                88506..88621
misc feature
                /note="similar to EST Y08714 (NID:g1620957)"
misc feature
                88506..88613
                /note="similar to EST AW491691 (NID:g7061972)"
misc feature
                88506..88613
                /note="match to EST H11135 (NID:g875955) ym09b02.r1"
                88506..88613
misc feature
                /note="similar to EST Y08709 (NID:g1620946)"
                88683..88695
misc feature
                /note="match to EST AA449630 (NID:g2163380) zx08f01.r1"
                89129..89424
repeat region
                /rpt family="Alu"
                90480..90775
repeat region
                /rpt_family="Alu"
                9184\overline{3}..91908
repeat region
                /rpt_family="MIR"
misc feature
                92306..92475
                 /note="similar to EST AW632612 (NID:g7389692)"
misc feature
                92331..92475
                 /note="similar to EST Y08709 (NID:g1620946)"
misc feature
                92332..92476
                /note="similar to EST AW491691 (NID:g7061972)"
misc feature
                92332..92429
                /note="match to EST H11135 (NID:g875955) ym09b02.r1"
                92334..92475
misc feature
                /note="match to EST R23506 (NID:g778394) yg29a10.r1"
misc feature
                92344..92475
                /note="match to EST F12201 (NID:g706543)"
misc feature
                93242..93497
                /note="similar to EST AW450196 (NID:g6990972)"
                93389..93521
repeat region
                /rpt family="Alu"
                94544..94564
repeat region
                /rpt_family="(CAG)n"
                94589..94751
repeat region
                /rpt_family="L2"
                95385..95513
misc feature
                /note="match to EST F12201 (NID:g706543)"
                95385..95558
misc_feature
                /note="match to EST R23506 (NID:g778394) yg29a10.r1"
misc feature
                95385..95490
                /note="similar to EST AW632612 (NID:g7389692)"
misc feature
                95385..95409
                /note="similar to EST Y08709 (NID:g1620946)"
misc feature
                97080..97145
                /note="match to EST R23506 (NID:g778394) yg29a10.r1"
                97354..97665
repeat region
                /rpt_family="Alu"
                97878..98399
misc_feature
                /note="similar to EST AI355055 (NID:g4095208) qu16f03.x1"
                97945..98499
misc feature
                /note="similar to EST AI652234 (NID:q4736213) wb28a07.x1"
                98119..98499
misc feature
                /note="similar to EST AW197335 (NID:g6476565) xm38f04.x1"
repeat region
                98197..98233
                /rpt_family="L1"
                98296..98333
repeat region
```

/rpt family="AT rich"

```
repeat region
                 98463..98487
                 /rpt_family="AT_rich"
                 99065..99189
repeat region
                 /rpt family="Alu"
                 complement (99092..99389)
STS
                 /db xref="GI:1113546"
                 99528..99643
repeat region
                 /rpt family="MaLR"
                 99974..100140
repeat region
                 /rpt family="MER1 type"
repeat region
                 101024..101068
                 /rpt family="L1"
                 1011\overline{0}6..101126
repeat region
                 /rpt family="(CA)n"
                 1011\overline{3}8..101493
repeat region
                 /rpt family="L1"
                 1016\overline{5}3..101821
repeat region
                 /rpt family="MER1 type"
                 101956..102045
repeat region
                 /rpt_family="L2"
                 102149..102258
repeat region
                 /rpt_family="L2"
misc feature
                 102347..102659
                 /note="match to EST AA603017 (NID:g2436878) np32a04.s1"
misc feature
                 102384..102638
                 /note="similar to EST AI695847 (NID:g4983747), wb79e04.x1"
                 102617..102897
repeat region
                 /rpt family="Alu"
                 103487..103660
repeat region
                 /rpt family="MER1 type"
                 104380..104463
repeat region
                 /rpt_family="L2"
                 1045\overline{5}3...104601
repeat_region
                 /rpt family="Retroviral"
                 104602..104716
repeat region
                 /rpt family="Alu"
                 104717..104943
repeat region
                 /rpt_family="Retroviral"
                 104935..105044
repeat region
                 /rpt family="Retroviral"
                 105103..105173
repeat_region
                 /rpt family="L2"
                 105939..106238
misc feature
                 /note="match to EST R36426 (NID:g793327) yh92f05.r1"
                 105959..106152
STS
                 /db xref="GI:1113458"
                 106192..106494
repeat region
                 /rpt_family="Alu"
repeat region
                 107176..107282
                 /rpt family="MIR"
repeat region
                 107378..107592
                 /rpt family="MER2 type"
                 107593..107709
repeat region
                 /rpt family="MER2 type"
                 1077\overline{1}0..107976
repeat region
                 /rpt family="L2"
                 108357..108641
repeat region
                 /rpt family="Alu"
misc feature
                 108566..108629
                 /note="similar to EST AI695847 (NID:q4983747) wb79e04.x1"
misc feature
                 108589...108629
                 /note="match to EST AA603017 (NID:g2436878) np32a04.s1"
                 108589..108630
misc feature
                 /note="match to EST R36426 (NID:g793327) yh92f05.r1"
                 108827..108861
repeat region
                 /rpt_family="AT_rich"
```

repeat region

```
/rpt family="Alu"
                 11\overline{0}1\overline{7}8..110727
repeat region
                 /rpt family="L1"
                 111399..111602
repeat region
                 /rpt family="MIR"
                 1119\overline{2}8..112074
repeat region
                 /rpt family="MER1 type"
repeat region
                 113935..114085
                 /rpt family="L1"
                 114147..114693
repeat region
                 /rpt family="MER2 type"
                 114822..114969
repeat region
                 /rpt family="L1"
                 114975..115072
repeat region
                 /rpt family="L1"
                 115061..115663
repeat region
                 /rpt_family="L1"
                 115805..116064
repeat region
                 /rpt_family="L1"
                 116225..116508
repeat region
                 /rpt_family="Alu"
                 116514..116572
repeat region
                 /rpt family="AT rich"
misc feature
                 117487..117867
                 /note="match to EST AA206752 (NID:g1802122) zq79c05.r1"
                 117635..118031
misc feature
                 /note="similar to EST AI206336 (NID:g3765008) qr21g05.x1"
repeat region
                 118259...118448
                 /rpt family="Other"
                 1186\overline{0}3..118666
repeat region
                 /rpt_family="Retroviral"
                 118826..118940
repeat_region
                 /rpt family="L2"
                 120199..120223
repeat region
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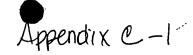
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AC005586	8468933	2	Jun 12 2000 8:30	Dead
AC005586	3907529	1	Nov 22 1998 18:11	Dead
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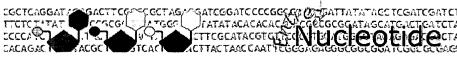
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Revised: October 24, 2001.

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Date of Deposit: February 8, 2002 DOCKET NO. V0139/7038/HCL/MAT





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☐ 1: AC005586[gi:3510275]

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AUTHORS	Waterston, R.H.				
TITLE	The sequence of Homo sapiens clone				
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AUTHORS	Waterston, R.H.				
TITLE	Direct Submission				
JOURNAL	Submitted (01-SEP-1998) Genome Sequencing Center, Washington				
	University School of Medicine, 4444 Forest Park Parkway, St. Louis,				
	MO 63108, USA				
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	* NOTE: This is a 'working draft' sequence. It currently				
	* consists of 18 contigs. The true order of the pieces				
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	* This record will be updated with the finished sequence				
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Revised: October 24, 2001.

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Express Mail No. EL844533597US Date of Deposit: February 8, 2002 DOCKET NO. V0139/7038/HCL/MAT

ATTORNEY'S DOCKET NO.: V0139/7038 (HCL/MAT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s):

Nicholas H. Heintz and Christopher R. Houchens

Serial No.

09/477,392

Filed:

January 4, 2000

For:

RIP60 NUCLEIC ACID AND POLYPEPTIDE SEQUENCES AND

USES THEREFOR

Examiner:

Robert A. Zeman

Art Unit:

1645

COMMISSIONER FOR PATENTS WASHINGTON, D.C. 20231

DECLARATION OF NICHOLAS H. HEINTZ UNDER 37 C.F.R. § 1.131

Sir:

I, Nicholas H. Heintz, declare that:

- 1. I am an inventor of the above-identified patent application. I make this declaration in support of that application and in response to the Office Action (paper no. 12) dated October 9, 2001.
- 2. The purpose of this declaration is to establish reduction to practice of the claimed invention in a WTO member country prior to September 1, 1998, the date of deposit with GenBank of the sequence having Accession Number AC005586, by Sulston et al. This sequence was cited by the Examiner in the above-identified Office Action.
- 3. To establish reduction to practice of the claimed invention, I submit herewith a copy of the nucleic acid sequence of RIP60 as in my possession prior to September 1, 1998, as Exhibit 1. Nucleotides 19-2972 of the sequence in Exhibit 1 correspond to nucleotides 1-2954 of the nucleic acid sequence of RIP60 filed in the patent application (i.e., SEQ ID NO:1). The sequence of SEQ ID NO:1 is appended herewith as Exhibit 2. An alignment of the sequences in Exhibits 1 and 2

591594.1

Serial No.: 09/477,392 - 2 -

was conducted using the "Blast 2 Sequences" tool found at the NCBI web site. The results of this alignment, appended herewith as Exhibit 3, demonstrate that there is 100% identity of these sequences in the regions listed above. The remaining 18 nucleotides upstream (i.e., 5') and 4 nucleotides downstream (i.e., 3') of the region of identity correspond to sequences from the vector used to clone the RIP60 nucleic acid sequence.

4. From Exhibit 1, one of ordinary skill in the art would recognize that I had reduction to practice of the claimed invention in a WTO member country prior to September 1, 1998.

I, the undersigned, declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under §1001 of title 18 of the United States Code, and that such willful false statements may jeopardize the validity of this document and any patent which may issue from the above-identified patent application.

Date: Feb 6, 2002

Nicholas H. Heintz, Ph.D.

Department of Pathology

University of Vermont College of Medicine

Burlington VT 05405

350

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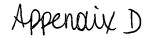


EXHIBIT 1

Complete RIP60 Sequence Prior to September 1998

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EXHIBIT 2

RIP60 Sequence as filed (i.e., SEQ ID NO:1)

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Entrez

NCB1

Berry z sequences



elp

BLAST 2 SEQUENCES

This tool produces the alignment of two given sequences using BLAST engine for local alignment. The stand-alone executable for blasting two sequences (bl2seq) can be retrieved from NCBI ftp site Reference: Tatiana A. Tatusova, Thomas L. Madden (1999), "Blast 2 sequences - a new tool for comparing protein and nucleotide sequences", FEMS Microbiol Lett. 174:247-250

Program blastn Matrix Not Applicable	
Parameters used in <u>BLASTN</u> program only: Reward for a match: 1 Penalty for a mismatch: -2 Use <u>Mega BLAST</u> Strand option Both strands	
Open gap 5 and extension gap 2 penalties gap x_dropoff 50 expect 1 word size 11 Filter	
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Comments and suggestions to: <u>blast-help@ncbi.nlm.nih.gov</u>

Credits to: Tatiana Tatusov and Tom Madden

Entrez

BLAST

OMIMO

Taxonomy

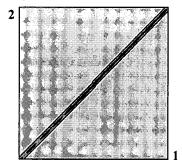
Structure

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Sequence 1 |cl|seq 1 | Length 2976 (1 .. 2976)

Sequence 2 | cl|seq 2 | Length 2954 (1 .. 2954)



compauson of Sequence puor to September 1998 and sequence as filed SERIDNO:

NOTE: The statistics (bitscore and expect value) is calculated based on the size of nr database

NOTE: If protein translation is reversed, please repeat the search with reverse strand of the query sequence

Score = 5680 bits (2954), Expect = 0.0Identities = (2954/2954 (100%))

Strand = Plus / Plus

Query: 19 cgctgtttgtccagcttctcagagttgctgtgcagctcggatgtggcataggaaacagca 78 Sbjct: 1 cgctgtttgtccagcttctcagagttgctgtgcagctcggatgtggcataggaaacagca 60 filod. Query: 79 gacacagggagagggcagcataaggcactgtagggagcagtggccacattttctgcagag 138 Sbjct: 61 gacacagggagagggcagcataaggcactgtagggagcagtggccacattttctgcagag 120 Query: 139 gaagaaccgatgctggaacgtcgttgcaggggccccctggccatgggcctggcccagccc 198 Sbjct: 121 gaagaaccgatgctggaacgtcgttgcaggggccccctggccatgggcctggcccagccc 180 cgactcctttctgggccctcccaggagtcaccccagaccctggggaaggagtcccgcggg 258 Query: 199 Sbjct: 181 cgactcctttctgggccctcccaggagtcaccccagaccctggggaaggagtcccgcggg 240

Query: 319 cgctgtgcccactgtcgaaggcacttccctggctgggtggctctgtgggcttcacacccgc 378

Sbjct:	301		360
Query: Sbjct:		cggtgccaggcccggctgcccttgccctgccctgagtgtggccgtcgctttcgccatgcc	
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Ouerv:	1099	qaqqqtcqqcccaqqccqccccqqcccqqqaqccccaqctqccaqccqqccccaq	1158

Query:	1159	gagtccgcggccgagcccaccccggcggtacctctgaaaccggcccaggagccgccgcca	1218
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Ouerv	1219	ggggccccgccagagcacccgcaggacccgatcgaagcccccccc	1278
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SDJCc.	1201	ggggccccgccagagcacccgcccgacccgacccgacccagcccccc	1200
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Query:	2719	ctctgcttgagcacttaggtgacaggaacttccgcacctcctgaggccctggatgattct	2778

Sbjct: 2701 ctctgcttgagcacttaggtgacaggaacttccgcacctcctgaggccctggatgattct 2760 Query: 2839 tataatttctacctattgggccttgttctgttctctggaactaaacagaacaaccattta 2898 Sbjct: 2821 tataatttctacctattgggccttgttctgttctctggaactaaacagaacaaccattta 2880 Query: 2959 aaaaaaaaaaaaa 2972 Sbjct: 2941 aaaaaaaaaaaaa 2954 CPU time: 0.10 user secs. 0.02 sys. secs 0.12 total secs. Lambda K 0.621 1.33 1.12 Gapped Н Lambda K 1.33 0.621 1.12 Matrix: blastn matrix:1 -2 Gap Penalties: Existence: 5, Extension: 2 Number of Hits to DB: 83 Number of Sequences: 0 Number of extensions: 83 Number of successful extensions: 71 Number of sequences better than 1.0: 1 length of query: 2954 length of database: 4,677,375,331 effective HSP length: 25 effective length of query: 2929 effective length of database: 4,674,138,981 effective search space: 13690553075349 effective search space used: 13690553075349 T: 0 A: 30 X1: 6 (11.5 bits) X2: 26 (50.0 bits) S1: 12 (23.8 bits) S2: 23 (44.9 bits)

Appendix E

CURRENT PROTOCOLS IN HUMAN GENETICS

VOLUME 1

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RNase A stock solution (DNase-free), 2 mg/ml

Dissolve RNase A (e.g., Sigma) in DEPC-treated H₂O (UNIT 7.1 to 2 mg/ml min in a 100°C water bath. Store ≤1 year at 4°C.

The activity of the enzyme varies from lot to lot; therefore, prepare several 10-ml of each dilution to facilitate standardization.

SDS, 20%

Dissolve 20 g SDS (sodium dodecyl sulfate or sodium lauryl sulfate) in H_2O_1 ml total with stirring (it may be necessary to heat the solution slightly to fully disthe powder). Filter sterilize using a 0.45- μ m filter.

SOC medium

35 g yeast extract

20 g tryptone

0.5 g NaCl

2.5 ml 1 M KCl

 H_2O to 960 ml

Adjust pH to 7.0 with 5 M NaOH (~0.2 ml)

Autoclave 25 min

Cool to 50°C

Add the following sterile ingredients:

10 ml 1 M MgCl₂ (10 mM final)

10 ml 1 M MgSO₄ (10 mM final)

20 ml 1 M glucose (20 mM final)

Store <1 year at 4°C

1 M glucose stock should be sterilized by filtration.

Sodium acetate, 3 M

408 g sodium acetate trihydrate (NaC₂H₃O₂·3H₂O)

800 ml H₂O

Adjust pH to 5.2 with 3 M acetic acid

Add H₂O to 1 liter

Sodium acetate buffer, 0.2 M

Solution A: 11.55 ml glacial acetic acid/liter (0.2 M).

Solution B: 27.2 g sodium acetate (NaC₂H₃O₂·3H₂O)/liter (0.2 M).

Referring to Table A.2D.3 for desired pH, mix the indicated volumes of solution and B, then dilute with H₂O to 200 ml. (See Potassium acetate buffer recipe further details.)

CAUTION: Glacial acetic acid is hazardous; see APPENDIX 2 for safety guideline

Sodium phosphate buffer, 0.2 M

Solution A: 27.6 g NaH₂PO₄·H₂O per liter (0.2 M).

Solution B: 53.65 g Na₂HPO₄·7H₂O per liter (0.2 M).

Referring to Table A.2D.4 for desired pH, mix the indicated volumes of solution and B, then dilute with H_2O to 200 ml. (Also see Potassium phosphate buffer E

SSC (sodium chloride/sodium citrate), 20×

175 g NaCl (3 M)

88 g trisodium citrate dihydrate Na₃C₆H₅O₇·2H₂O (0.3 M)

 H_2O to 800 ml

Adjust pH to 7.0 with 1 M HCl

Add H₂O to 1 liter

C mmon Buffers, Media, and Stock Solutions